Assembly Instructions

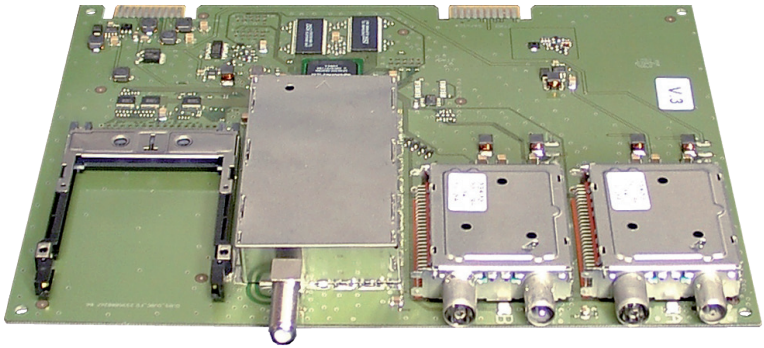
English

Grundig SAT Systems

Head-End Digital Modulator

Terrestrial

HDMT 660 CI TPS



Notes on the Assembly Instructions.
As well as this supplementary Assembly Instructions, the Assembly Instructions for the STC 160 apply.

CE

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1 Safety regulations

- The standards EN/DIN EN 50083 resp. IEC/EN/DIN EN 60728 must be observed.
- Do not perform installation and service work during thunderstorms.
- Assembly, installation and servicing should be carried out by authorised electricians.
- Switch off the operating voltage of the system before beginning with assembly or service work.
- Avoid short circuits!
- Observe the relevant standards, regulations and guidelines on the installation and operation of antenna systems.
- To ensure electromagnetic compatibility, make sure all connections are tight and the covers are screwed on securely.
- No liability is accepted for damage caused by faulty connections or inappropriate handling of the device.

Check the head-end station according to the safety instructions listed in their assembly instruction.

Take precautions to prevent static discharge when working on the device!

Electronic devices should never be disposed of in the household rubbish. In accordance with directive 2002/96/EC of the European Parliament and the European Council from January 27, 2003 which addresses old electronic and electrical devices, such devices must be disposed of at a designated collection facility. At the end of its service life, please take your device to one of these public collection facilities for proper disposal.

2 General information

2.1 Scope of delivery

1 Head-end Digital Modulator HDMT 660 CI TPS
1 HF connection cable
1 Brief Assembly Instructions

2.2 Meaning of the symbols used

Important note

—> General note

< > – < / >
^ v – ^ / v Optional use of the buttons

• Performing works

2.3 Technical data

The requirements of the following EU directives are met:
2006/95/EC, 2004/108/EC
The product fulfils the guidelines and standards for CE labelling (page 37).

Unless otherwise noted all values are specified as "typical".

HF input:
Frequency range: ..... 146.0 ... 862.0 MHz
Channel range: .....C 5 ... C 69
Input level: ..... 60 dBµV ... 80 dBµV
Input impedance: .....75 Ω
Loop-through loss: .....0 dB

HF output:
Output frequency: ..... 42.0 ... 868.0 MHz
Channel separation: ..... 2 ... 8 MHz
Output symbol rate: .....1000 ... 7500 kSymb/s
Modulation method [QAM]: 4, 16, 32, 64, 128, 256
Modulation error rate: .....> 39 dB
Output level: ..... 81 dBµV
Output impedance: .....75 Ω

Connections:
HF inputs: .....2 IEC sockets (female)
HF loop-through output: ..... 2 IEC sockets (male)
HF output: ..... 1 F socket
Slot for CA module: 1
Connection strip (20-pin): .....For supply voltages and control circuits

2.4 Description

The Digital Modulator HDMT 660 CI TPS, in the following called COFDM-QAM module converts two COFDM-modulated data streams into two QAM-modulated data streams. The COFDM-QAM module has two HF inputs, one HF output and 2 loop-through outputs.
The COFDM-QAM module is equipped with two channel strips ("**A**" and "**B**"). The channel strips consist of the digital tuners, the digital signal processing levels and an output converter. The channel strips are indicated in the head-end station display with "**Bx ...A**" and "**Bx ...B**". Using an adequate CA module encoded channels can be decoded via channel strip "**A**". The control of the module takes place via the control unit of the head-end station.
Two LEDs indicate if the respective channel strip is switched on (LED illuminates) or off, and also provide an indication of the signal quality based on their colour.
The integrated TPS module (Transport Stream Processing) processes the data from the demodulated transport streams. This enables service information (NIT – Network Information Table) to be changed, data rates to be increased (stuffing) and stations to be deleted from the transport stream (thus optimising bandwidth for the other stations being transmitted). In addition, the operator ID (required for e.g. visAvision) can be set.
The HF output signals are sent through the HF output of the COFDM-QAM module to the output collector.
When the head-end station is switched on, the two-line LC display shows the "**SETUP**" menu and the software version of the control unit. The head-end station output level can be adjusted in this menu.
The COFDM-QAM module operating software can be updated using a PC or notebook and the software "**BE-Flash**" via the 9-pin D-SUB socket on the head-end station. You can find the current operating software for the COFDM-QAM module, the software "**BE-Flash**" and the current assembly instructions on the website "***www.gss.de***".

To operate the COFDM-QAM module the **software version of the control unit** must be "**V 10**" or higher.

The COFDM-QAM module is designed exclusively for use in the STC 160 head-end station.

TPS MODULE FUNCTIONS

When converting COFDM-modulated signals to QAM-modulated cable signals, the demodulated data stream can be accessed via the integrated TPS module. This data stream, also called transport stream, contains several stations in all their components (video, audio, data and service information), which can be changed using the TPS module.

STATION FILTER

Individual stations can be deleted. This reduces the data rate. As a result, a lower output symbol rate can be selected.

STUFFING

The transport stream is padded using what is known as zero data. This increases the data rate and, consequently, the output symbol rate. Changing the output symbol rate suitably alters the bandwidth used (halving the output symbol rate roughly halves the bandwidth at the output).

CHANGING SERVICE INFORMATION

The transport stream contains data in the form of tables which the receivers evaluate and require for convenient use. The TPS module can adjust the "Network Information Table" (NIT) to accommodate the new station data. The "NIT" contains data which is required by the set-top box for the automatic search feature.

CHANGING THE OPERATOR ID (CAT)

Some network operators transmit an operator ID in the data stream (e.g. visAvision). By changing the CAT the operator ID can be adjusted to the demands.

Effective assignment of cable channels with low bandwidths

SelecPlex®

Channels with low bandwidths are the result of filtering out several unwanted stations from the data stream. These "narrow" channels can then be arranged in one channel to save space.

—> The required bandwidth (in kHz) is roughly equal to the symbol rate (kSymb/s) plus 20%.

The modulator in this module employs automatic neighbouring-channel assignment. This means that when the output channel or the output frequency for channel strip "**A**" is set, the output channel or the output frequency of channel strip "**B**" will always be 8 MHz above the output channel or the output frequency of channel strip "**A**".
If SelecPlex® will be used, the normal channel separation of 8 MHz can be reduced up to 2 MHz via the frequency setting for channel strip "**B**".

3 Installation

– Ensure the head-end station is mounted so it will not be able to vibrate. Avoid, for example, mounting the head-end station onto a lift shaft or any other wall or floor construction that vibrates in a similar way.
– Before installing or changing a module, switch off the head-end station or unplug the power cable from the mains power socket.

Take measures to protect against ESD!

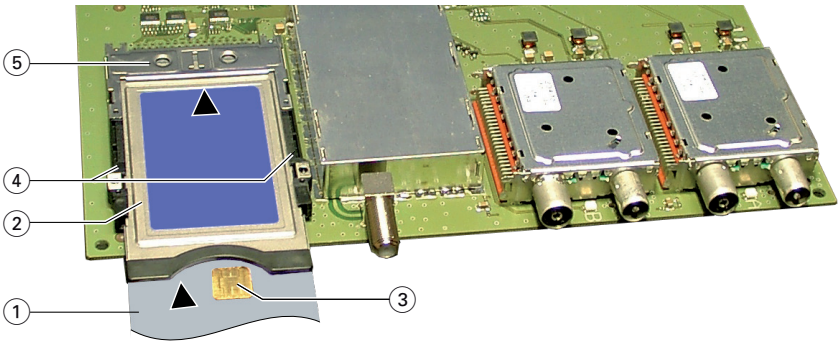
- Open the housing of the head-end station in accordance with the assembly instructions for the STC 160.

3.1 Retrofitting a CA module

The COFDM-QAM module is equipped with a common interface for CA modules of various scrambling systems and service providers. Scrambled channels can only be descrambled with a CA module suitable for the scrambling system and the corresponding smart card. The smart card contains all the information for authorisation, descrambling and subscription.

- Check with the distributor or manufacturer of the CA module to be used to ensure that it is suitable for the reception of several channels.
- **The module's hardware and software have been thoroughly prepared and tested.**
- **Any changes made by program vendors to the structures in the program data might impair or even prevent this function.**
- When working with the CA module, please read the corresponding operating manual from the respective provider.

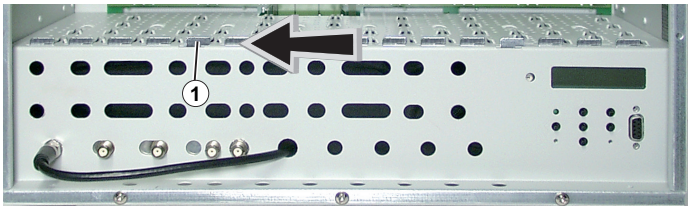
- Insert the smart card (1) into the CA module (2) so that the chip (3) on the smart card faces the thicker side (top) of the CA module.
- Push the CA module (2) without canting into the guide rails (4) of the common interface slot (5) according to the following picture and contact it to the common interface.



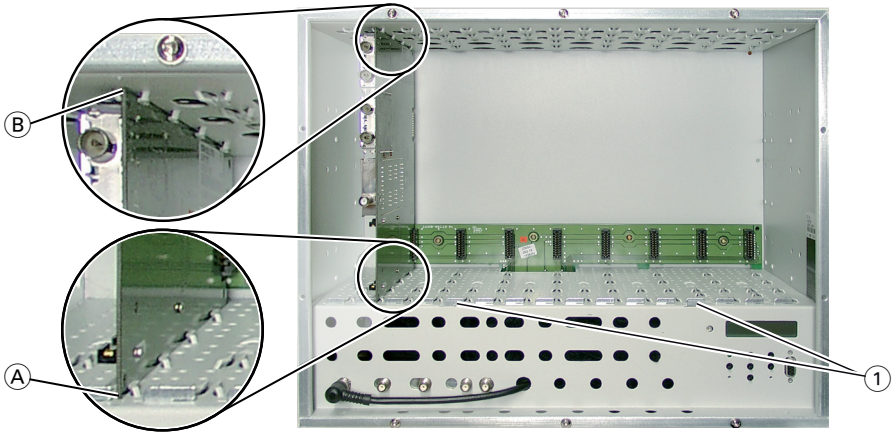
3.2 Installing the COFDM-QAM module

– Check that the plug contacts of the CA module are tightly seated in the terminal strip on the common interface of the COFDM-QAM module and make sure there is reliable contact.
– When installing a module, make sure that it is inserted in one of the long, numbered grooves in front of the contact strip on the board at the rear wall of the housing.
– **The shorter, non-numbered grooves without a contact strip on the board at the rear wall of the housing, are for add-on modules only.**

- Open the housing of the head-end station in accordance with the assembly instructions for the STC 160.
- Open the locking device (1) in the direction of the arrow.



- Insert the COFDM-QAM module in grooves (A) and (B) of an open slot (with contact strip on the board at the rear wall of the housing) and gently slide it into the head-end station until it makes contact with the board on the rear wall.
- After installing the COFDM-QAM module close the locking device (1) in the direction of the arrow.



3.3 Connecting the COFDM-QAM module

- Connect the HF inputs Ⓒ (tuner "A") and Ⓓ (tuner "B") on the COFDM-QAM module (fig. 4) to the preinstalled F terminals in the rear wall of the head-end station via the cable inlets Ⓕ using HF cables made on-site (length approx. 80 cm).
  To connect the second tuner the loop-through-output Ⓔ of the other tuner can be used, if necessary.
- After programming, connect the modulator output Ⓖ to one of the input sockets Ⓗ of the output collector.

4 The control panel at a glance

4.1 Menu items

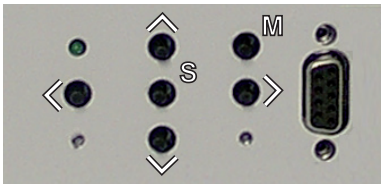
Program the COFDM-QAM module using the buttons on the head-end station control panel. The menus appear on the two-line display of the control panel. The parameters and functions to be set are underlined.

With the ⋀ button select the channel strip / other modules.

You can use the **M** button to select the following menu items:

- Activating the module and channel strip
- Channel setting / frequency setting
- Output channel / output frequency
- Output level
- Input channel
- Hierarchical modulation
- Station filter
- CA module (if available, only channel strip A)
  PID Check
  Menu/Edit
- QAM modulation
- Stuffing
- Substitute signal
- Network Information Table (NIT)
- Network/operator identification (Conditional Access Table)
- Deleting/Renaming a PID
- Factory reset
- Save data

4.2 Functions of the control panel buttons



< > To move the cursor, call up functions

⋀ ⋁ To adjust values and functions

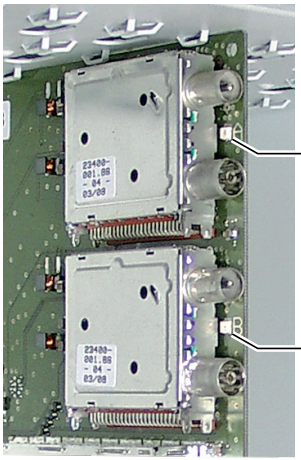
S To save the programmed data

M To switch to the next menu

5 Programming

5.1 Preparation

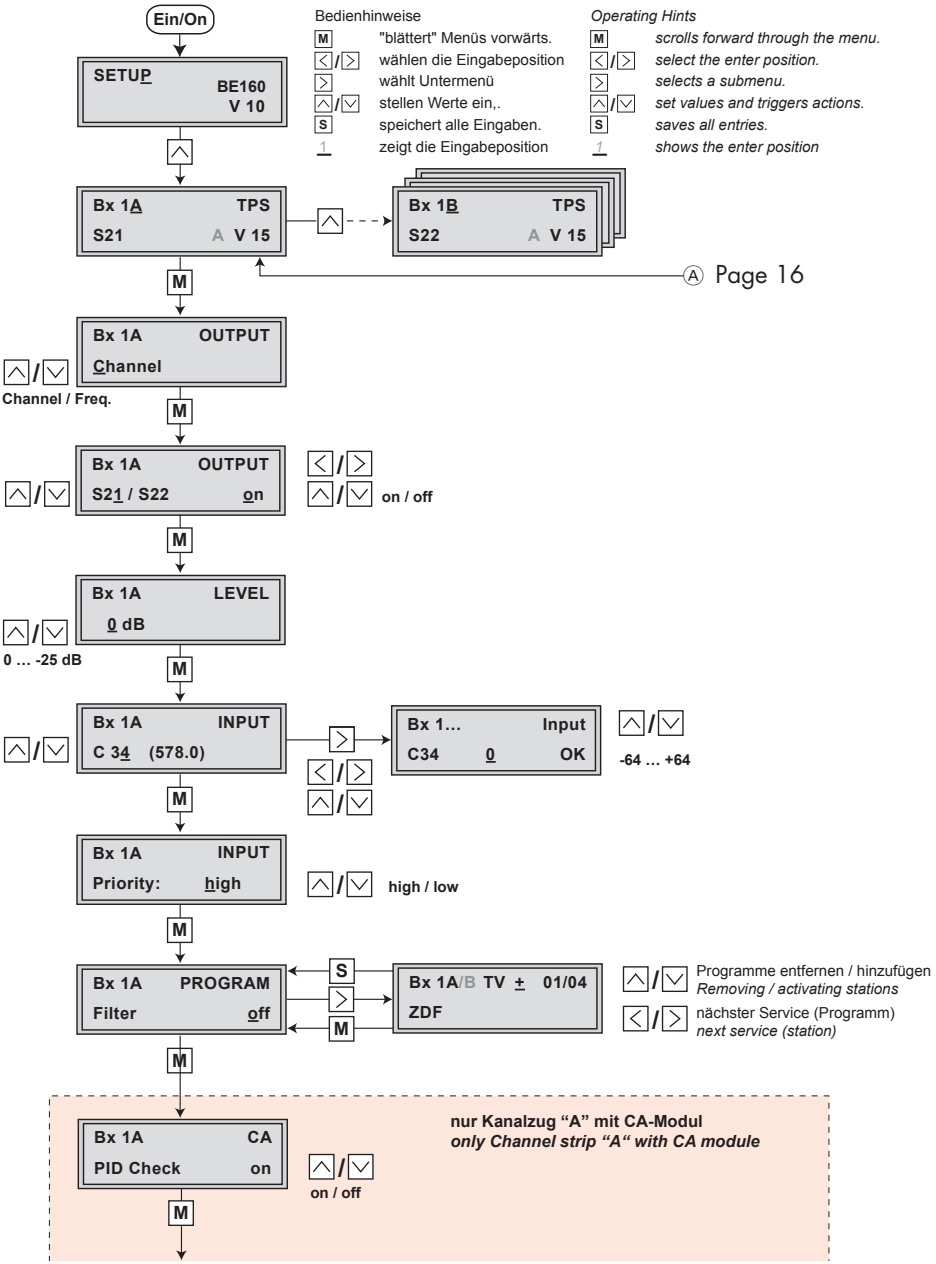
- Connect the test receiver to the modulator output on the COFDM-QAM module Ⓖ (page 11) or to the HF output on the output collector if it is already connected.
- Adjust the test receiver to the output channel of the channel strip to be set.
- Switch on the channel strip (modulator) if necessary (page 19). For each channel strip, there is an LED which indicates if the channel strip is switched on.

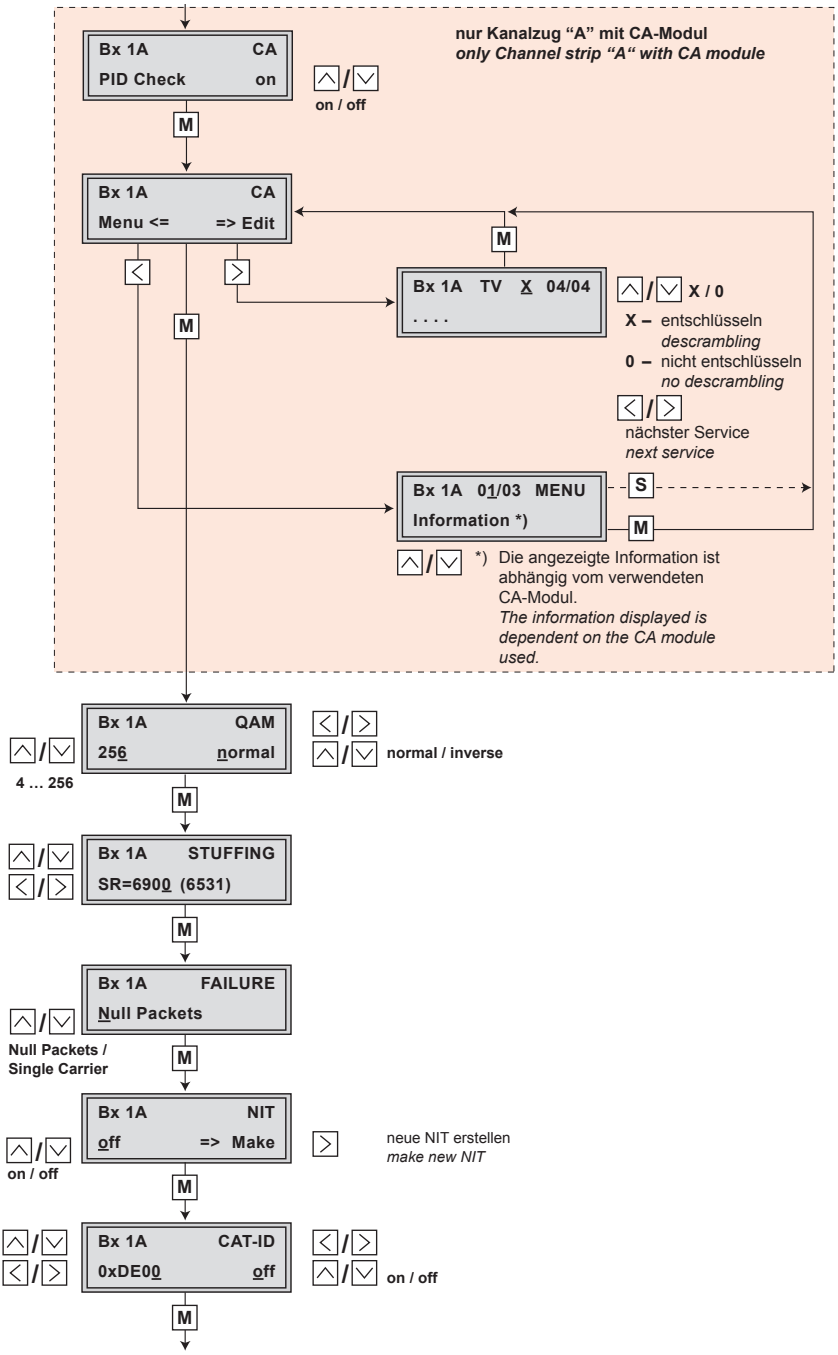


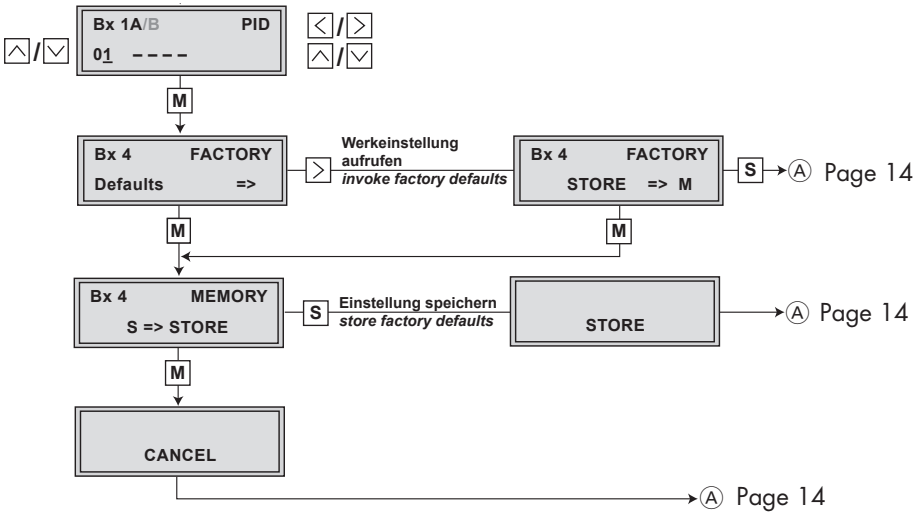
5.2 Notes on level setting

– In order to prevent interference within the head-end station and the cable system, the output level of the COFDM-QAM module must be lowered by 10 dB compared to the system level at 64 QAM, and by 4 dB compared to the system level at 256 QAM.
– Check the output level of the output collector according to the assembly instructions of the head-end station STC 160 and if necessary set it to the demand of the cable system.

5.3 Programming procedure


Ein/On
SETUP BE160 V 10
Bx 1A TPS S21 A V 15
Bx 1B TPS S22 A V 15
Page 16
Bx 1A OUTPUT Channel
Channel / Freq.
Bx 1A OUTPUT S21 / S22 on
on / off
Bx 1A LEVEL 0 dB
0 … -25 dB
Bx 1A INPUT C 34 (578.0)
Bx 1… Input C34 0 OK
-64 … +64
Bx 1A INPUT Priority: high
high / low
Bx 1A PROGRAM Filter off
Bx 1A/B TV ± 01/04 ZDF
Programme entfernen / hinzufügen
Removing / activating stations
nächster Service (Programm)
next service (station)
Bx 1A CA PID Check on
on / off
nur Kanalzug "A" mit CA-Modul
only Channel strip "A" with CA module
Bedienhinweise
"blättert" Menüs vorwärts.
wählen die Eingabeposition
wählt Untermenü
stellen Werte ein,.
speichert alle Eingaben.
zeigt die Eingabeposition
Operating Hints
scrolls forward through the menu.
select the enter position.
selects a submenu.
set values and triggers actions.
saves all entries.
shows the enter position


Bx 1A CA
PID Check on
on / off
M
Bx 1A CA
Menu <= => Edit
nur Kanalzug "A" mit CA-Modul
only Channel strip "A" with CA module
Bx 1A TV X 04/04
. . . .
X / 0
X – entschlüsseln
descrambling
0 – nicht entschlüsseln
no descrambling
nächster Service
next service
Bx 1A 01/03 MENU
Information *)
S
*) Die angezeigte Information ist abhängig vom verwendeten CA-Modul.
The information displayed is dependent on the CA module used.
Bx 1A QAM
256 normal
4 … 256
normal / inverse
Bx 1A STUFFING
SR=6900 (6531)
Bx 1A FAILURE
Null Packets
Null Packets / Single Carrier
Bx 1A NIT
off => Make
on / off
neue NIT erstellen
make new NIT
Bx 1A CAT-ID
0xDE00 off
on / off

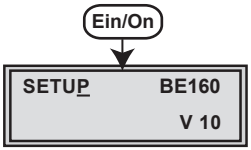


5.4 Programming the COFDM-QAM module

—> Pressing the **M** button for longer than 2 seconds cancels the programming procedure. This takes you back to the program item "**Selecting the module/channel strip**" from any menu. Any entries that have not been saved are reset to the previous settings.

—> Entries in the menus can be saved by pressing the **S** key. You are taken back to the "**Selecting the module/channel strip**" menu item.

- Switch on the head-end station.

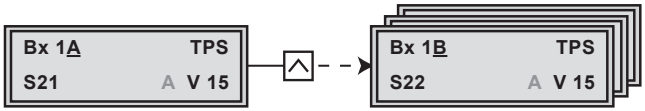


—> The display shows "**SETUP BE160**" and the software version of the head-end station (e.g. V 10).

—> In the "**SETUP**" menu, the output level of the output collector can be adjusted (see STC 160 assembly instructions).

SELECTING THE MODULE / CHANNEL STRIP

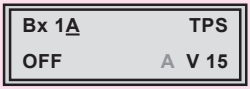
- If necessary, press [∧][∨] repeatedly to select the particular module (**Bx** …) or channel strip "**A**" or "**B**" to be programmed.



—> The display shows, e.g., the "**Bx 1A TPS**" menu.

"**Bx**"	indicates the slot
"**1**"	indicates slot no. 1
"**A**"	indicates channel strip "**A**"
"**TPS**"	type of module
"**S21**"	set channel
"**V 15**"	software version of the module

—> If a channel strip is selected whose modulator is switched off, instead of the frequency or the channel "**OFF**" is displayed.



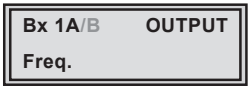
—> Without using a CA module, the programming procedure is the same for channel strips "**A**" and "**B**". If a CA module will be used note the supplementary programming procedure on page 32.

- Press the [M] button.

—> The "Channel / Frequency setting" – "**OUTPUT**" menu is activated.

Channel / Frequency setting

In this menu, you can choose whether you require the channel or frequency setting for the adjustment of the HF output. The channel setting covers the range of channels S21 … C69, the frequency setting covers the range from 42.0 MHz to 860.0 MHz.



—> The QAM signal is normally transmitted with a bandwidth of 8 MHz. This means that you can only use the channel centre frequency of the existing channel raster in the range of channels S21 … C69 (frequency raster 8 MHz). The CCIR channel raster is 7 MHz in the range of the lower frequency bands (channels C2 … S20). Therefore the frequency setting is used here. If one uses the existing channel raster of 7 MHz in these channel ranges, this will result in interference (overlapping) with the 8 MHz QAM signal packages, thus causing transmission problems.

—> For programming in these channel ranges and in the frequency ranges below them, we recommend starting with channel S21 / 306 MHz going back in steps of 8 MHz (s. table on page 35), or reducing the bandwidth of the QAM output signal by removing stations.

—> Using "SelecPlex®" only the frequency setting can be used.

- Use ⋀⋁ to select channel setting "**Channel**" or frequency setting "**Freq.**".
- Press the **M** button.

—> The "Output channel" resp. "Output frequency" – "**OUTPUT**" menu is activated.

Output frequency, Output channel, Modulator

In this menu, dependent on the setting before, you set the output frequency (42.0 ... 860.0 MHz) resp the output channel (S21 ... C69) of the channel strip. Additionally the modulator of the channel strip can be switched off or on.

Bx 1A	OUTPUT
S21 / S22	on

oder

Bx 1A	OUTPUT
306,0 / 314,0	on

- Use the [<][>] buttons to position the cursor under the digit to be set for the frequency or channel display then use [^][v] to set the desired output frequency or channel.

—> The modulator in this module employs automatic neighbouring-channel assignment. This means that the output channel/frequency of channel strip "**B**" will always be 1 channel/8 MHz above the output channel/frequency of channel strip "**A**".

- Using the [>] button, move the cursor under "**on**" and then use the [^][v] buttons to switch off or on the channel strip (modulator) if necessary.

—> The switched off channel strip is indicated in the display with " **- - -** ".

Bx 1A	OUTPUT
– – – / S22	off

oder

Bx 1A	OUTPUT
----- / 314,0	off

—> **Channel strip "B":** Use the same process as described above.

Bx 1B	OUTPUT
S21 / S22	on

oder

Bx 1B	OUTPUT
306,0 / 314,0	on

Bx 1B	OUTPUT
S21 / – – –	off

oder

Bx 1B	OUTPUT
306,0 / -----	off

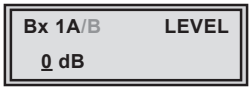
—> For using "SelecPlex®", in **channel strip "B"** only the normal channel separation of 8 MHz can be reduced up to 2 MHz.

- Press the [M] button.

—> The "Output level" – "**LEVEL**" menu is activated.

Output level

This menu item is used to set the output levels of the modulators of the module´s channel strips to the same value and to level them to the output levels of the modulators of other modules used.



- Use the test receiver to measure the output level of the channel strip and make note of the value.
- When adjusting the second channel strip, compare its value with the value noted for the first channel strip.
- Measure the output levels of the other modulators used and make notes of their values.
- Use the ⋀⋁ buttons to balance the higher output level of the one channel strip to the lower output level of the other channel strip and the output levels of the other modulators used ("**0 dB**" … "**–25 dB**").

- Press the **M** button.

—> The "Input channel" – "**INPUT**" menu is activated.

Input channel

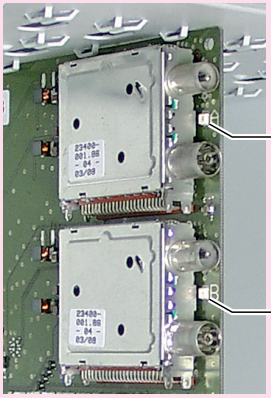
In this menu you can set the input channel. You can also carry out the fine-tuning.

—> Besides the channel display the appropriate input frequency is displayed.

- Use ⋀⋁ to set the input channel.

—> A status LED indicates the quality of the received transport stream:

LED indicator	Indication
Green	Signal quality is good
Red	No signal
Off	The channel strip (modulator) is switched off



SETTING THE FINE-TUNING

If necessary set the fine tuning (±64 steps) via this submenu.

—> Herein you can tune to transmitters which do not match to the channel grid.

—> If fine tuning is not necessary press the M button to select the next menu. The menu "Hierarchical modulation" – "**Input – Priority**" is activated.

- Press the > button.

Bx 1A/B		Input
C34	0	OK

—> Instead of the frequency the current value of the fine tuning is displayed.

- Use the ⋀⋁ buttons to change the value step by step until the desired transmitter "locks" (indication "OK").

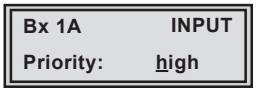
- Press the M button.

—> The "Hierarchical modulation" – "**Input – Priority**" menu is activated.

HIERARCHICAL MODULATION

In order to enable reception in areas of bad receiving conditions, a so-called "hierarchical modulation" can be used by broadcasters. The transmitted channel contains 2 data streams (high and low priority). In this case one of the data streams must be selected in the receiver.

—> This setting is not relevant in case of standard modulation.



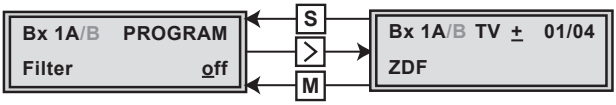
- By pressing ⋀⋁, set to "**high**" or "**low**".

- Press the M button.

—> The "Station filter" – "**PROGRAM**" menu is activated.

STATION FILTER

The default setting for the station filter is "**off**".
In this menu you define the stations received to be transmitted. If stations are deactivated the output symbol rate is reduced.



- Press the [>] button.

—> **All stations from the channel strip** will be read, and then displayed with name and station type.

—> If no station is found, the following error message will appear in the display "**FILTER: no Service**".
In this case, check the configuration of the antenna system and head-end station, as well as the previously adjusted settings for the COFDM-QAM module.

—> The display shows e.g.: **Bx 1A TV + 01/04**
ZDF

Meaning of the indicators in the example:

"**Bx 1A**"	Slot 1, channel strip "**A**"
"**TV**"	TV channel type
" **+** "	The currently selected station is switched on.
"**01/04**"	The 1st of 4 stations is being displayed.
"**ZDF**"	Station name

Further possible terms displayed:

"**RA**"	Radio channel type For radio stations, the background of the screen of the connected TV or test receiver is darkened.
" **–** "	The currently selected station is switched off.
" ***** "	The star means that the TV or radio station selected is scrambled. To enable the stations, the CA module and the appropriate smart card of the station provider are required.

—> If a service number (e.g. "**SERVICE 131**") appears instead of "**TV**" or "**RA**", this indicates that an unnamed station or an undefined data stream is being received.

- Use the [<][>] buttons to call up the stations in sequential order, then use [^][v] to activate (indicated by " **+** ") or to remove them (indicated by " **–** ").

- To activate the station filter press the [M] button.

—> The display shows "**PROGRAM Filter on**".
—> If stations are removed the corresponding PID's (audio, video, text) are removed from the data stream and the PAT and SDT tables are updated. This reduces the bandwidth of the data stream.
—> The station filter remains deactivated ("**off**") if no station was removed.

TEST THE STATUS OF THE INDIVIDUAL STATIONS

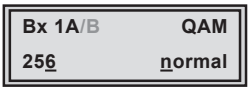
If the station filter is switched on, press the [>] button. In this mode you can use the [<][>] buttons to scroll through the station list, and [^][v] to switch stations back on or off again.

- In the "**PROGRAM Filter on**" menu the station filter can be switched "**off**" using the buttons [^][v] .
- Press the [M] button.

—> If no CA module is installed the "QAM modulation" – "**QAM**" menu is activated when the channel strips "**A**" and "**B**" are programmed.
—> Programming the channel strip "**A**" with a CA module installed the menus configuring the CA module – "**CA**" are activated (from page 32 on).

QAM MODULATION

In this menu, you can set the QAM modulation and invert the user signal.



- Use [^][v] to set the QAM modulation ("**4**" … "**256**").

—> For higher QAM modulation, the output symbol rate is lowered. An output QAM modulation of > 64 QAM places a large burden on the cable network. Due to noise, delay and frequency response problems, reception of the converted output signal can be impeded.

Inverting the user signal

For exceptional cases and "older" digital cable receivers, the spectral position of the user signal can be inverted.

- Use [<][>] to position the cursor under "**normal**".
- Use [^][v] to set the spectral position to "**inverse**".
- Press the [M] button.

—> The "Output data rate" – "**STUFFING**" menu is activated.

Output data rate

SR=6900 (= "number 1"): Active output symbol rate
(**6531**) (= "number 2"): Current measured output symbol rate.

—> If the station filter is activated, this value will be less than the value of "number 1". The value will fluctuate, as the data rates for individual stations are dynamically altered by the broadcasters.

- Use the [<][>] buttons to position the cursor under the digit to be set for "number 1", then use [^][v] to set the symbol rate. The value set corresponds to the new output symbol rate.

Increasing the value of "number 1"

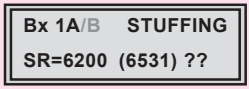
—> The value of "number 1" can be increased as required up to 7500.
—> Symbol rates > 7000 kSymb/s increase the bandwidth of the output signal. Thus the output channels will overlap. In this case the bandwidth of the neighbouring-channels has to be decreased (see "SelecPlex®", pages 8 and 21).

Approximately calculation of the output bandwidth:

Symbol rate [MSymb/s]	x	1.15	=	Bandwidth [MHz]
7.2 [MSymb/s]	x	1.15	=	8.28 [MHz]
6.9 [MSymb/s]	x	1.15	=	7.935 [MHz]

Reducing the value of "number 1".

—> If the station filter is switched on ("**on**"), "number 1" can be reduced. To do this, observe "number 2" for 30 seconds and note the highest value. Add roughly 10 % to this value. Do not reduce the value of "number 1" to a value less than that of "number 2".
If the value of "number 1" is less than that of "number 2" , question marks "**??**" will appear in the display.



- Press the M button.

—> The "Substitute signal in the case of an incorrect input signal" – "**FAILURE**" is activated.

SUBSTITUTE SIGNAL IN THE CASE OF AN INCORRECT INPUT SIGNAL

You use this menu to set whether a "**Null Packets**" QAM signal or a "**Single Carrier**" signal should be provided as an output signal whenever an incorrect input signal occurs.

- Use the ∧ ∨ buttons to set the output signal required.
- Press the M button.

—> The "Network Information Table" – "**NIT**" menu is activated.

- To switch the NIT on or off ("**on**"/"**off**") press the ⋀⋁ buttons.
- Press the ⋗ button to activate the NIT ("**Make**").

—> All active cassettes which are able to output a NIT ("NIT cassettes") must be set and ready for reception.
—> The NITs of all "NIT cassettes" are switched on.
—> The cassette fetches all the information (output frequencies, output data rates, etc.) it needs from all the "NIT cassettes" in order to generate the NIT. This process may take a few seconds.
Then the NIT is generated, added and sent to all "NIT cassettes". The other "NIT cassettes" also add this new NIT. The status of all "NIT cassettes" in the NIT menu changes to "**on**".
The display shows: "**read ... / copy ...**".

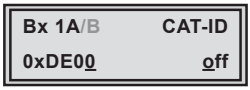
- To switch off the new NIT ("**off**") press the ⋁ button.

—> The NITs of the other "NIT cassettes" will stay switched on. When the NIT of the cassette is switched on again ("**on**") by pressing the ⋁ button, the previously generated NIT is added again. If you have changed parameters in the meantime, you must first select "**Make**" to generate a new, up-to-date NIT.
—> Using the PSW 160 remote control software a NIT for several stations can be created.

- Press the M button.

—> The "Network/operator identification" – "**CAT-ID**" menu is activated.

In this menu, you can change the network/operator identification (CAT-ID – **C**onditional **A**ccess **T**able - **Id**entification), for example of the visAvision transponder (Eutelsat 8° West).



CAT is not to be changed.

- Press the M button.

—> The "Saving data" – "**MEMORY**" menu is activated (page 32).

CAT is to be changed.

The network operator e.g. requires that you set the operator ID of the visAvision transponder to "2".

- Use the < > buttons to position the cursor under the digit to be set.
- Use ^ v to change the operator ID from "**0xDE00**" to "**0xDE02**".
- Use the > button to position the cursor under "**off**," then use ^ v to activate the new CAT "**on**".

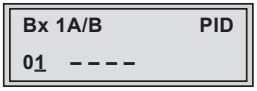
—> The menu display switches to "**modified**".
—> If you try to change the network/operator identification (operator ID) of a transponder which cannot be modified, "**not modified**" appears in the display.

- Press the M button.

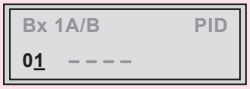
—> The "Deleting/Renaming a PID" – "**PID**" menu is activated

Deleting (data content) a PID / Renaming a PID

In this menu you can delete or rename up to 9 PIDs of the transport stream. The changes are stored at 9 memory locations.



—> First, memory location 01 is shown.



Deleting a PID (data content)

In this menu the data content of a PID of the transport stream can be deleted (tables will not be changed).

- First, select the desired memory location using buttons ⋀⋁.
- Use button > to place the cursor under the right digit of the PID input field ("– – – –") and set the hexadecimal number of the PID to be deleted (e.g. 1FFE) using buttons ⋀⋁ <>.

—> "drop" is displayed at the right side.

- Repeat this process in order to delete more PIDs (max. 9).

—> In order to undo any changes, select the corresponding memory location(s) and set the hexadecimal number of the PID, which was dropped, to "1FFF"

—> "– – – –" is displayed.

RENAMING A PID

In this menu you can allocate a new address to a PID retaining the complete data content.

- First, select the desired memory location using buttons [^][v].
- Use button [>] to place the cursor under the right digit of the PID input field ("– – – –") and set the hexadecimal number of the PID to be changed (e.g. 1FFE) using buttons [^][v] [<][>].

- Place the Cursor below the "drop" indicator using button [>].
- Enter the new PID (e.g. 1FFD) using buttons [^][v] [<][>].

- Repeat this process in order to rename more PIDs (max. 9).

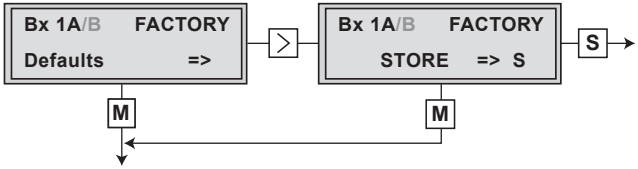
—> In order to undo any changes, select the corresponding memory location(s) and set the hexadecimal number of the PID, which was renamed, to "1FFF"
—> "– – – –" is displayed.

- Press the [M] button.

—> The "Factory reset" – "**FACTORY Defaults**" main menu is activated.

FACTORY RESET

In this menu you can reset all settings (together for both lines) to the factory defaults.



- If you don´t like to invoke the factory defaults press button [M].

—> The "Saving data" – "**MEMORY**" menu is activated (Page 32).

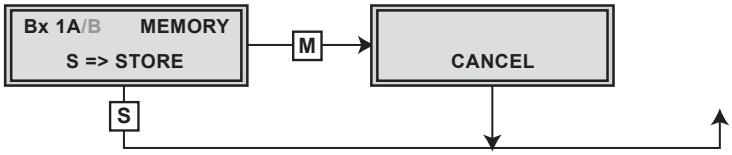
- Press the [>] button.

—> The factory defaults are invoked (**"FACTORY STORE"**).

- Press the [S] button.

—> The factory defaults are saved.
The display shows "STORE"
—> Return to "Selecting the module" (page 17).
—> By pressing the [M] button the "Saving data" – "**MEMORY**" menu is activated.

SAVING DATA



- All programmed data is saved by pressing the S button.

—> You will be returned to the menu item "**Selecting the module / channel strip**" (page 17).
—> By pressing the M button, you will be returned to the menu item "**Selecting the module / channel strip**" **without** saving the programmed data.

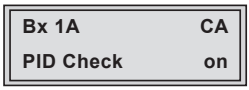
SETTING THE CA MODULE

In order for this function of the CA module to be possible, stations capable of being decoded by the CA module you are using and your smart card must be selected in the "Station filter" – "**PROGRAM**" menu (page 23).

—> Where both scrambled stations and unscrambled regional broadcasters are transmitted via a single channel, short-term picture loss may occur when switching between scrambled and unscrambled broadcasts.

PID MONITORING

In this menu the PID monitoring can be switched off.



—> The factory default of the PID monitoring is switched on.
If particular PIDs are not descrambled the CI module is reset. Additionally dropouts may occur if several stations are descrambled. To prevent this the PID monitoring can be switched off.

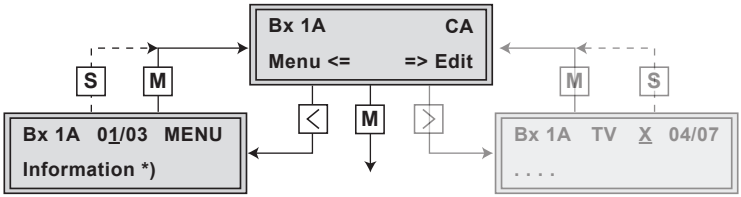
- Use the ∧∨ buttons to switch "**off**" or "**on**" the PID monitoring.

- Press the M button.

—> The "Configuring the CA module" – "**CA**" submenu is activated.

Configuring the CA module

A menu has been provided for these settings, which is displayed on your TV screen. The menu varies according to which CA module you are using. For this reason, please refer to the operating manual of your particular CA module. The menus are displayed on the TV screen whenever this is connected. The relevant information is shown in the head-end station. This may appear as a fixed display or as scrolling text according to display capabilities.



—> By pressing the M button you can skip the "Configuring the CA module" – "**CA**" menu and activate the "QAM modulation" – "**QAM**" menu (page 24).

- Press the < button to activate the menu of the CA module.

—> The display shows e.g.: **Bx 1A 01/03 MENU**
Information

Meaning of the indicators:

"**Bx 1A**"	Slot 1, channel strip "**A**"
"**01/03**"	The first of three menu items is activated.
"**MENU**"	The menu of the CA module is activated.

For the explanation of further details please use the operating instructions of the CA module used.

- Use the ^ v buttons to activate the menu desired.
- Press the > button to activate the menu.
- Use the ^ v buttons to select the function desired.
- To set the CA module use the < > and ^ v buttons.
- All settings are saved by pressing the S button.

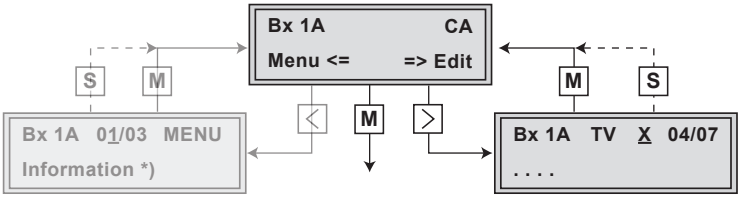
—> You will be returned to the "Configuring the CA module" – "**CA**" menu item.
—> By pressing the [M] button you can cancel the settings in the menu of the CA module and are returned to the "Configuring the CA module" – "**CA**" menu.

- Press the [>] button.

—> The "Selecting stations" – "**CA Edit**" is activated.

SELECTING STATIONS

In this menu you select the desired stations from the encoded data stream, which are to be descrambled.



—> The display shows e.g.: **Bx 1A TV X 04/07**
. . . .

Meaning of the indicators in the example:

"**Bx 1A**"	Slot 1, channel strip "**A**"
"**TV**"	TV channel type
"**X**"	The currently selected station will be descrambled.
"**04/07**"	The 4th of 7 stations read is being displayed.
"**. . . .**"	Station name

Further possible terms displayed:

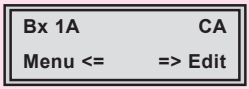
"**RA**"	Radio channel type
"**0**"	The currently selected station remains unchanged.

- Use the [<][>] buttons to call up the stations in sequential order which are to be descrambled, then use [^][v] to descramble (" **X** ") or not to descramble them (" **0** ").

Save changes and activate the station filter:

- Press the **M** button.

—> The filter is activated. The display shows the "Configuring the CA module" – "**CA**" menu.



- Press the **M** button.

—> The "QAM modulation" – "**QAM**" menu is activated (page 25).

6 Final procedures

After installing the head-end station, upgrading accessories or installing modules it is necessary to tighten all cable connections, cable terminals and cover screws in order to maintain compliance with current EMC regulations.

- Securely tighten the cable connections (F connectors) using an open-ended spanner (spanner gap 11 mm).
- After programming, connect the modulator output (G) to one of the input sockets (H) of the output collector (page 10, fig. 4).
- Test the output level of the output collector according to the STC 160 assembly instructions and set the output level required for the cable system.
- Mount the base plate and the front cover (see STC 160 assembly instructions).

Advice for a frequency raster (8 MHz) in the Band I/III

Frequenzraster Frequency raster [MHz]	Frequenzraster Frequency raster [MHz]	Frequenzraster Frequency raster [MHz]	Frequenzraster Frequency raster [MHz]	Frequenzraster Frequency raster [MHz]	Frequenzraster Frequency raster [MHz]
42.00	82.00	146.00	186.00	226.00	266.00
50.00	114.00	154.00	194.00	234.00	274.00
58.00	122.00	162.00	202.00	242.00	282.00
66.00	130.00	170.00	210.00	250.00	290.00
74.00	138.00	178.00	218.00	258.00	298.00

CCIR – Hyperband (Frequency raster 8 MHz)

Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]	Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]	Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]	Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]	Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]
S 21	306.00	S 26	346.00	S 30	378.00	S 34	410.00	S 38	442.00
S 22	314.00	S 27	354.00	S 31	386.00	S 35	418.00	S 39	450.00
S 23	322.00	S 28	362.00	S 32	394.00	S 36	426.00	S 40	458.00
S 24	330.00	S 29	370.00	S 33	402.00	S 37	434.00	S 41	466.00
S 25	338.00								

CCIR – Band IV/V (Frequency raster 8 MHz)

Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]	Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]	Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]	Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]	Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]
C 21	474.00	C 31	554.00	C 41	634.00	C 51	714.00	C 61	794.00
C 22	482.00	C 32	562.00	C 42	642.00	C 52	722.00	C 62	802.00
C 23	490.00	C 33	570.00	C 43	650.00	C 53	730.00	C 63	810.00
C 24	498.00	C 34	578.00	C 44	658.00	C 54	738.00	C 64	818.00
C 25	506.00	C 35	586.00	C 45	666.00	C 55	746.00	C 65	826.00
C 26	514.00	C 36	594.00	C 46	674.00	C 56	754.00	C 66	834.00
C 27	522.00	C 37	602.00	C 47	682.00	C 57	762.00	C 67	842.00
C 28	530.00	C 38	610.00	C 48	690.00	C 58	770.00	C 68	850.00
C 29	538.00	C 39	618.00	C 49	698.00	C 59	778.00	C 69	858.00
C 30	546.00	C 40	626.00	C 50	706.00	C 60	786.00		

CE - Declaration of Conformity

GSS	Konformitätserklärung Declaration of Conformity / Déclaration de Conformité 018 / 08	CE

Der Hersteller/Importeur The manufacturer/importer Le producteur/importateur	**GSS GRUNDIG SAT-Systems GmbH**
Anschrift / Address / Adresse	**Beuthener Straße 43, D-90471 Nürnberg, Germany**

erklärt hiermit eigenverantwortlich, daß das Produkt:
declare under their sole responsibility that the product: / déclare, que le produit:

Bezeichnung / Name / Description	**Empfangsmodul**
Type / Model / Type	**GSS HDMT 660 CI TPS**
Bestell-Nr. / Order-No. / Nº de réf.	**GAK 7900**

folgenden Normen entspricht:
is in accordance with the following specifications: / correspond aux normes suivantes:

EN 50083-2:	***2006***
EN 60950-1 :	***2001***

Das Produkt erfüllt somit die Forderungen folgender EG-Richtlinien:
Therefore the product fulfils the demands of the following EC-Directives:
Le produit satisfait ainsi aux conditions des directives suivantes de la CE:

2006/95/EG	**Richtlinie betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen** **Directive relating to electrical equipment designed for use within certain voltage limits** **Directive relatives au matériel électrique destiné à être employé dans certaines limites de tension**
2004/108/EG	**Richtlinie über die elektromagnetische Verträglichkeit** **Directive relating to electromagnetic compatibility** **Directive relatives à la compatibilité électromagnétique**

Nürnberg, 4. Juli 2008

Michael Bierschneider
Leiter Entwicklung
Manager Development / Directeur Développement

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